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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/823,272	04/02/2001	Hyun-doo Shin	Q59549	7285
7590	01/29/2004		EXAMINER	HUNG, YUBIN
SUGHRUE, MION, ZINN, MACPEAK & SEAS, PLLC 2100 PENNSYLVANIA AVENUE, N.W. WASHINGTON, DC 20037-3213			ART UNIT	PAPER NUMBER
			2625	
			DATE MAILED: 01/29/2004	7

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/823,272	SHIN ET AL. <i>[Signature]</i>	
	Examiner	Art Unit	
	Yubin Hung	2625	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) Responsive to communication(s) filed on _____.
- 2a) This action is FINAL. 2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) Claim(s) 1-13 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) Claim(s) _____ is/are allowed.
- 6) Claim(s) 1-13 is/are rejected.
- 7) Claim(s) _____ is/are objected to.
- 8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on 02 April 2001 is/are: a) accepted or b) objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) All
 - b) Some *
 - c) None of:
 1. Certified copies of the priority documents have been received.
 2. Certified copies of the priority documents have been received in Application No. _____.
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 13) Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
 - a) The translation of the foreign language provisional application has been received.
- 14) Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

- 1) Notice of References Cited (PTO-892)
- 2) Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) Information Disclosure Statement(s) (PTO-1449) Paper No(s) 5,6.
- 4) Interview Summary (PTO-413) Paper No(s). _____.
- 5) Notice of Informal Patent Application (PTO-152)
- 6) Other: _____.

DETAILED ACTION

Oath/Declaration

1. Two copies of the declaration have been submitted; however, the claims to foreign priority under 35 USC 119(a) – (d) or 365 (b) in the respective declarations are not consistent.

2. On the declaration signed by Manjunath and Wu, The wrong box under the section “Priority Claim (35 USC 119 (a) – (d)” on P. 2 was checked.

Priority

3. Acknowledgment is made of applicant's claim for foreign priority based on an application filed in Korea on August 21, 2000. It is noted, however, that applicant has not filed a certified copy of the 2000-48323 application as required by 35 U.S.C. 119(b).
(The filed one is not a ribbon copy.)

Drawings

4. The drawings are objected to because of the hand-written correction made to Figure 1. A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

6. Claims 1, 7, 12, 13 are rejected under 35 U.S.C. 102(e) as being anticipated by Kothuri et al. (US 6,381,605).

Regarding claim 1, Kothuri et al. discloses

(a) Determining whether one or more cells, on each of which one or more of said plurality of feature vectors are correspondingly concentrated, exist [Fig. 3; Fig. 5, numerals 506, 518; Col. 14, line 55 – Col. 15, line 43]
(b) Hierarchically indexing the feature vector data space when it is determined that said one or more cells, on each of which said one or more of said plurality of feature vectors are correspondingly concentrated, exist in the step (a). [Col. 3, lines 27-37; Col. 14, lines 55-56]

7. Claim 7, being a medium claim of claim 1, is similarly analyzed and rejected.

8. Regarding claim 12, Kothurie et al. further discloses using nearest neighbor query to conduct search [Col. 19, lines 30-39]. Therefore, claim 12 is rejected per claim 1 and the additional disclosure recited above.

9. Claim 13 is similarly analyzed and rejected as per claim 12.

Claim Rejections - 35 USC § 103

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

11. Claims 2 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kothuri et al. (US 6,381,605) as applied to claims 1, 7, 12, 13 above, and further in view of "2n-Tree Classifiers" in IBM Technical Disclosure Bulletin, Vol. 34, No. 4B, September 1991, pp. 225-228 (hereinafter referred to as IBM-TDB).

12. Regarding claim 2, Kothuri et al. discloses everything except the following, which IBM-TDB teaches

- further comprising a step of (pa-1) partitioning the feature vector data space into a plurality of cells, including said one or more cells, having a uniform size, before the step (a)
[P. 1, Disclosure Text: lines 13-20]

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the invention of Kothuri et al. by using uniform partition as

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taught by IBM-TDB since this type of partitioning (e.g., quadtrees, hypercubes) are well known in the art and efficient implementation is readily available.

13. Claim 9, being a medium claim of claim 2, is similarly analyzed and rejected.

14. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kothuri et al. (US 6,381,605) as applied to claims 1, 7, 12, 13 above, and further in view of Massen (US 5,809,165).

15. Regarding claim 3, Kothuri et al. discloses everything except for the following, which Massen teaches:

- Constructing a histogram illustrating a number of said plurality of feature vectors in each of a plurality of cells, including said one or more cells; [Fig. 2A; Col. 2, lines 11-16; Col. 4, lines 3-10. Note that each histogram "bin" corresponds to a cell]
- Analyzing a distribution of said plurality of feature vectors using the histogram and determining whether said one or more cells, on each of which said one or more of said plurality of feature vectors are correspondingly concentrated, exist. [Fig. 2B; Col. 4, lines 29-32]

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the invention of Kothuri et al. by using the histogramming and thresholding techniques taught by Massen to identify the existence of cells with a

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concentration of feature vectors since such techniques are well known in the art and efficient implementation is readily available.

16. Claims 4-6, 8, 10, 12-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kothuri et al. (US 6,381,605) as applied to claims 1, 7, 12, 13 above, and further in view of "A Quantitative Analysis and Performance Study for Similarity-Search Methods in High-Dimensional Spaces," *Proceedings of the 24th International Conference on Very Large Data Base*, New York, August 1998, pp. 194-205 (Hereinafter referred to as Weber et al.).

17. Regarding claim 4, Kothuri et al. discloses everything except for the following, which Weber et al. teaches:

- The indexing method of claim 1, wherein the step (b) comprises the step of indexing the feature vector data space using a vector approximation file [Section 4.1, lines 1-13]

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the invention of Kothuri et al. by using VA-file for indexing as taught by Weber et al. in order to overcome the indexing difficulty resulted from increased dimensionality of the feature space.

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18. Claims 5 and 6 are similarly analyzed and rejected as per claims 1 and 4 since Kothurie et al. discloses recursive partition of cells in Figure 5 and Weber et al. teaches approximating the data points (i.e., feature vectors) that fall into each cell with the corresponding VA-file in lines 5-8 of Section 4.1.

19. Claim 8, being a medium claim of claim 4, is similarly analyzed and rejected as per claim 4.

20. Claim 10, being a medium claim of claim 6, is similarly analyzed and rejected as per claim 6.

21. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kothuri et al. (US 6,381,605) and Weber et al. as applied to claims 4-6, 8, 10 above, and further in view of Massen (US 5,809,165) (as applied to claim 3).

Regarding claim 11, it is a medium claim for the combined method of the methods recited in claims 3-5, respectively, and is therefore similarly analyzed and rejected as per claims 3-5.

Conclusion

22. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

- Fayaad et al. (US 6,263,334) – Discloses a density-based indexing method for efficient execution of high-dimensional nearest-neighbor queries on large databases
- Herbert (US 5,325,445) – Discloses a classification method that conducts a tree-like hierarchical decomposition of n-dimensional feature space for use in real-time defect classification.
- Castelli et al. (US 6,134,541) – Discloses a technique for searching multidimensional indexes using associated clustering and dimension reduction information.

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Yubin Hung whose telephone number is (703) 305-1896. The examiner can normally be reached on 7:30 - 4:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bhavesh Mehta can be reached on (703) 308-5246. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-4700.

Yubin Hung
Patent Examiner
January 23, 2004



Jayanti K. Patel
Primary Examiner